ABSTRACT

A universal rake receiver architecture includes modular independent processing units that can be flexibly programmed to support different modes of operation. The processing units are capable of performing the basic correlation calculations of DS-CDMA and each unit has an internal local memory and controller that controls its mode of operation. Each unit performs the required synchronization and demodulation operations for a multipath of a signal in the digital domain using all-digital frequency and timing correction techniques. Frequency feedback need not be supplied to the analog section of the receiver. Interpolation most preferably is used to find the optimum sampling position of each incoming chip. This independence allows the receiver to be used with one to several antennas without design modifications.